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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/364,159	07/30/1999	KOJI SUZUKI	YKI-0014	9014

23413 7590 04/12/2002

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EXAMINER

SCHECHTER, ANDREW M

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 04/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/364,159

Applicant(s)

SUZUKI ET AL.

Examiner

Andrew Schechter

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Reflective type liquid crystal display device having two-layer display electrodes"

Response to Arguments

2. Applicant's arguments filed 17 January 2002 have been fully considered.

With the filing of the certified translation of the priority document, the reference *Katsuya* ceases to be prior art and the rejections in view of it are hereby withdrawn.

Claim 1 has been amended to include the limitation of the previous claim 4, that the display electrode and back-surface electrode are patterned in the same shape. This limitation is already present in the independent claim 8. The previous rejections in view of *Lu*, which does not disclose or fairly suggest this feature, are hereby withdrawn.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application

by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 1, 2, 5, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by *Hirano*, U.S. Patent No. 6,292,241.

Hirano discloses [see Fig. 3, for example] a reflective type liquid crystal display device comprising a display electrode [E, element 2] made of a reflective material [Al-Nd-Si, an aluminum alloy] with a back-surface electrode [element 12, a Mo layer] disposed in contact with a back surface of the display electrode, and the two patterned into the same shape [see Figs. 3B-C]. Claim 1 is therefore anticipated. The method of manufacturing this device, comprising forming the back-surface electrode layer, the display electrode layer on it, and patterning the two in the same shape is also disclosed, so claim 8 is also anticipated.

The back surface electrode is Mo, a high melting point metal, so claim 2 is also anticipated.

The device further comprises a transistor [gate 7, drain electrode D, amorphous silicon layer 5] for controlling current to the display electrode, with the transistor and back-surface electrode electrically interconnected [col. 6, lines 32-40], so claim 5 is also anticipated.

5. Claims 1, 5, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by *Shimada*, U.S. Patent No. 5,877,832.

Shimada discloses [see Fig. 9, for instance] a reflective type liquid crystal display device comprising a reflective display electrode [40] and a back-surface electrode [11a], patterned in the same shape [see Figs 9A-B]. Claim 1 is therefore anticipated.

The device further comprises a transistor [see Figs. 8, 9A-B] the with back-surface electrode and the transistor electrically connected, so claim 5 is anticipated.

The method of making this device comprises the steps of claim 8. (Note that the claim language does not require the step of patterning the back-surface electrode and display electrode in the same shape to be a single operation; in *Shimada* this step includes patterning the back surface electrode, forming the bumps [100a] and then patterning the surface electrode.) Claim 8 is therefore anticipated as well.

6. Claims 1-3, 5, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by *Shintani et al.*, U.S. Patent No. 5,978,056.

Shintani discloses a reflective type LCD with a display electrode [8a] and a back-surface electrode [53] patterned in the same shape. Claim 1 is therefore anticipated.

The back-surface electrode is made of TiN (a high melting point metal, see discussion below regarding *Shimada* in view of *Kahn* applied to claims 7 and 10) and the display electrode is made of aluminum, so claims 2 and 3 are anticipated as well.

There is a transistor electrically connected to the back-surface electrode, so claim 5 is also anticipated.

Art Unit: 2871

The method of making the above device is also disclosed, so claim 8 is also anticipated.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Hirano* as applied to claim 2 above, and further in view of *Komatsubara et al.*, U.S. Patent No. 4,519,678.

The examiner understands the phrase "made of aluminum" in claim 3 to mean pure aluminum only, not materials comprising aluminum (if the applicants intend the broader meaning, they should bring this to the attention of the examiner, in which case *Hirano* would anticipate claim 3). *Hirano* discloses using an aluminum alloy (Al-Nd-Si) instead of aluminum. However, aluminum and aluminum alloys are art-recognized equivalents as materials for reflective pixel electrodes, as shown by *Komatsubara* for instance [col. 3, lines 38-39, and claim 7]. (Note: *Lu* also teaches this, col. 5, lines 47-54.) It would therefore have been obvious to one of ordinary skill in the art to use either in the device of *Hirano*, and claim 3 is therefore unpatentable.

Art Unit: 2871

9. Claims 6, 7, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Shimada* as applied to claims 1, 5, and 8 above, and further in view of *Kahn*, U.S. Patent No. 5,056,895.

Shimada discloses that a part of the back-surface electrode is connected to said active layer via a contact hole, but does not explicitly state that the transistor has a polycrystalline silicon (poly-silicon) layer. It appears to be either poly-silicon (in which case claim 6 would be anticipated) or amorphous silicon, which the examiner assumes for the sake of argument. It would be obvious to one of ordinary skill in the art to replace the amorphous silicon TFT of *Shimada* with a poly-silicon TFT, motivated by *Kahn's* teaching that this provides "improved electrical properties" and the advantage of allowing "integration of the matrix address and drive electronics on the same substrate." [col. 2, lines 20-23] Claim 6 is therefore unpatentable.

Shimada also discloses the step of forming an insulating film [9] to cover the TFT, and a contact hole [10], and the insulating film is formed by spin-coating [col. 7, lines 1-2] so it is a smoothened film. Claim 9 is therefore unpatentable as well.

The back-surface electrode in *Shimada* is made of ITO, which has a high melting point. It might be argued that ITO is a metal oxide rather than a metal, strictly speaking; however, since it is well-known to use metal oxide and similar films which are conducting along with pure metals in this art, the examiner understands ITO, along with W, Mo, Ti, TiN, TiW, Ta, Cr, further alloys of these, etc., to be a "high melting point metal". If the applicants has a different understanding of this phrase, they should bring it to the attention of the examiner. Claims 7 and 10 are therefore unpatentable.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Shimada* in view of *Kahn*, as applied to claim 10 above, and further in view of *Hirano*.

Shimada discloses using ITO for the back-surface electrode, but also states that it "may be formed of other types of metal" [col. 11, lines 4-5] without giving examples. The ITO film in *Shimada* serves as a back-surface electrode making good electrical contact to the reflective surface electrode. ITO and Mo are art-recognized equivalents for this purpose, as shown by their interchangeable use in this context in *Hirano* [col. 8, lines 28-30, for example]. One of ordinary skill in the art would therefore find it obvious to use Mo in place of the ITO in the device of *Shimada* in view of *Kahn*, so claim 11 is unpatentable.

Conclusion

11. Applicant's amendment and submission of a certified translation of their priority document necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


Art Unit: 2871

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (703) 306-5801. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Sikes can be reached on (703) 308-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 746-4711 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


Andrew Schechter
April 9, 2002


TOANTON
PRIMARY EXAMINER